

INDIAN RAILWAYS



सत्यमेव जयते

CHECKSHEETS

FOR

BOGIE FLAT STEEL WAGON

TYPE – BFNS22.9

BROAD GAUGE

(1676 MM)

S.No.	Month & Year of Revision / Amendment	Revision / Amendment	Page No.	Reason for Amendment
1.	January 2018	Revision - 00	-	First issue

ISSUED BY

RESEARCH DESIGNS AND STANDARDS ORGANISATION
MINISTRY OF RAILWAYS
LUCKNOW-226 011

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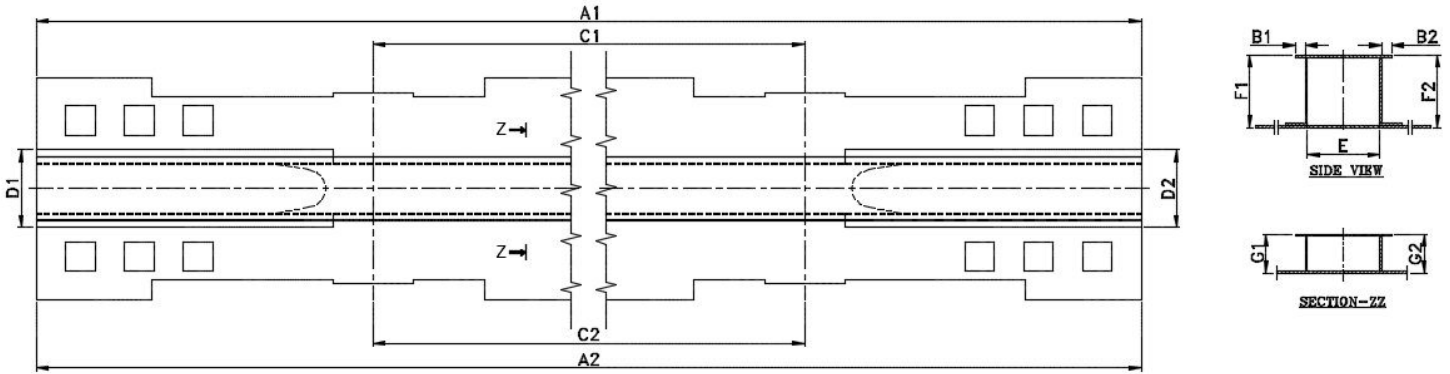
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Note :

These Check sheets do not detail all the dimensions or technical requirements of respective wagon assemblies / components.

These check sheets are issued only for General Guidance & assistance of inspecting officials. Notwithstanding the above, the inspecting officials are advised to refer to relevant drawings and / or relevant specifications to confirm conformity to the specified dimensions and technical details.

CENTRE GIRDER

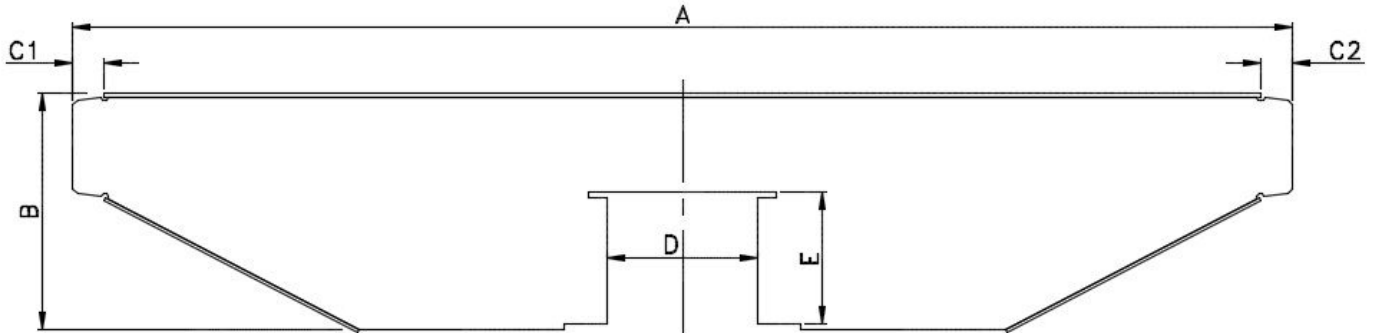


RDSO Drawing No :- WD-98057-S-6A_It.No-2_Alt-6			DATE :-			
Centre Girder SI No :-						
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks	
1	Fitment of all components					
1.1	Welding					
1.2	Dressing					
2	Dimensions	As follows				
	Location		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i	Over All Length	A1	13716, +7,-3			
		A2				
ii	Distance of Web plate from End of Top pl	B1	45, ±1			
		B2				
iii	Bolster Centre Distance	C1	9144, +5,-2			
		C2				
iv	Width of Centre Girder Top Pl	D1	437, ±2			
		D2				
v	Draft Gear Pocket	E	327, +3,-0			
vi	Height of Centre Girder	F1	327, ±1.5			
		F2				
vii	Height of Centre Girder at Section ZZ	G1	177, ±1.5			
		G2				

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

HEAD STOCK



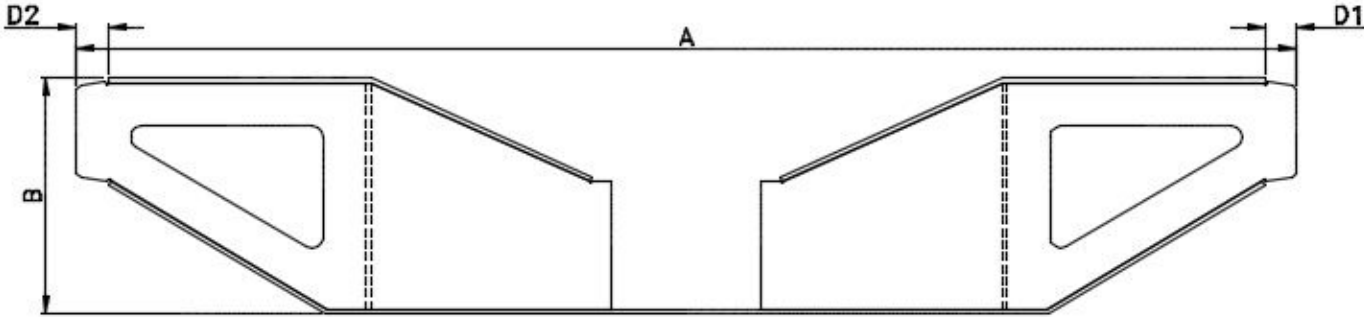
ELEVATION

RDSO Drawing No :- WD-98057-S-5_ It.No.-3_ Alt-5				DATE :-		
Headstock No :-						
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks	
1	Fitment of all components					
1.1	Welding/Riveting					
1.2	Dressing					
2	Dimensions	As follows				
	Location		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i	Over All Length	A	2827, ±2			
ii	Over All Height	B	549, ±1			
iii	Distance of Top flange from end of Headstock web	C1	73, ±1			
		C2				
iv	Inside Dimension	D	347, +2,-0			
v	Height	E	307, +2,-0			

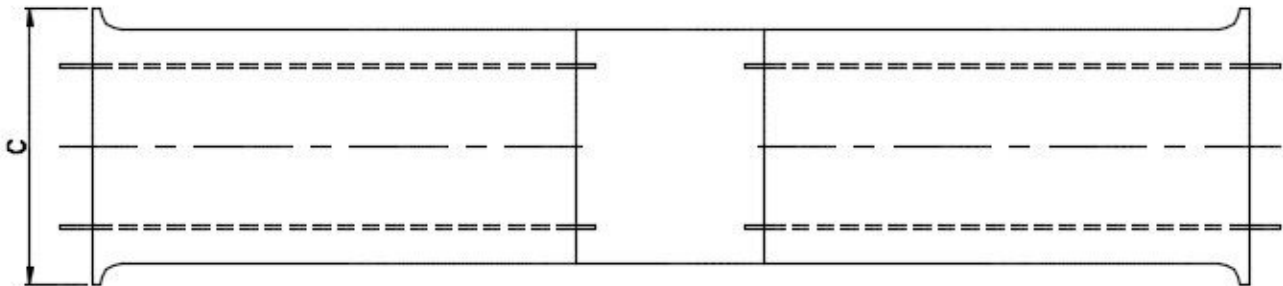
All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

BOLSTER



ELEVATION



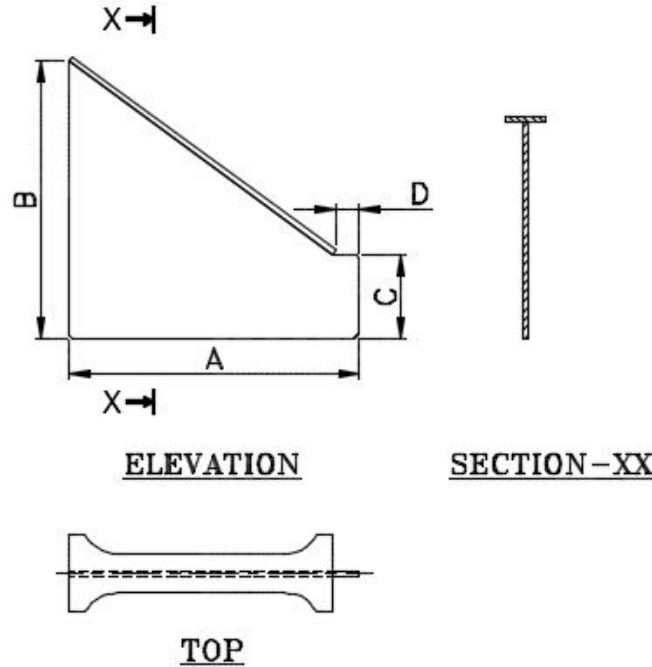
TOP

RDSO Drawing No :- WD-98057-S-5_ It.No.-2_ Alt-5				DATE :-	
Bolster No :-					
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks
1	Fitment of all components				
1.1	Welding/Riveting				
1.2	Dressing				
2	Dimensions	As follows			
	Location	Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
			Works Inspection	RDSO Inspection	
i	Over All Length	A	2827 ±2		
ii	Over All Height	B	549, ±1		
iii	Width of Bolster Over Top Pl	C	640, ±1		
iv	Distance of Top flange from end of Bolster web	D1	73, ±1		
		D2			

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

CROSS BAR (INNER) CENTRE

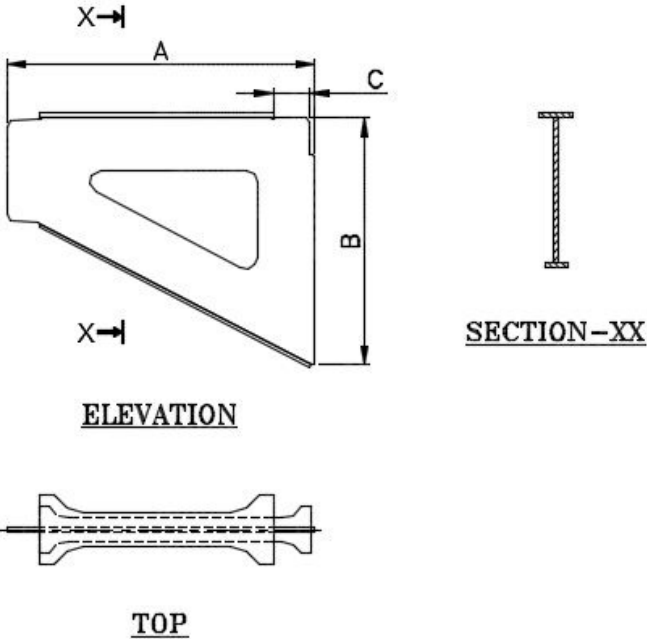


RDSO Drawing No :- WD-98057-S-06_It.No.-1_Alt-4				DATE :-		
Cross bar (Inner) Centre No :-						
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks	
1	Fitment of all components					
1.1	Welding					
1.2	Dressing					
2	Dimensions	As follows				
	Location		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i	Length Over Cross Member	A	558.5, +0,-2			
ii	Height at End	B	530, +0,-2			
iii	Height at Center Girder Inner	C	159, +0,-2			
iv	Distance of Top Flange at Top from Center Girder Inner pl	D	45, ±1			

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

CROSS BAR (OUTER)

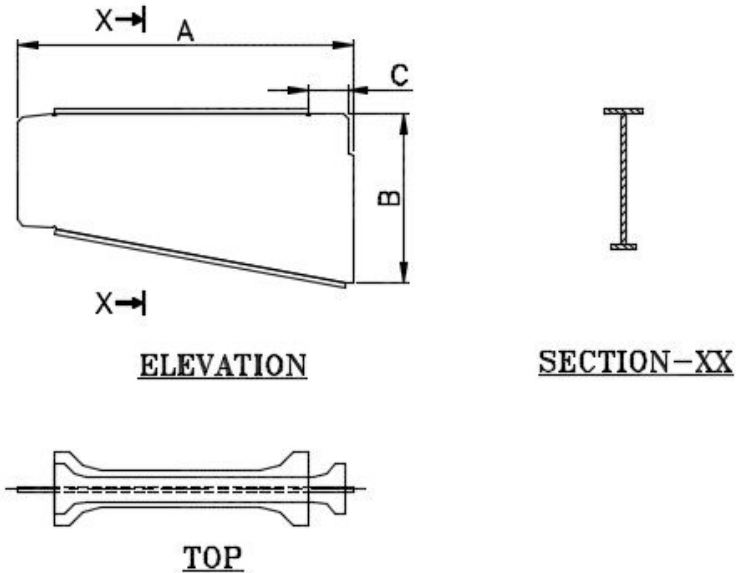


RDSO Drawing No :- WD-98057-S-06_It.No.-2_Alt-4				DATE :-		
Cross bar (Outer) No :-						
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks	
1	Fitment of all components					
1.1	Welding					
1.2	Dressing					
2	Dimensions	As follows				
	Location		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i	Overall Length	A	671.5, +0,-2			
ii	Overall Height	B	539, +0,-2			
iii	Distance of Top Flange at top from Crossbar web end	C	80, +2,-0			

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

CROSS BAR (OUTER) SHORT

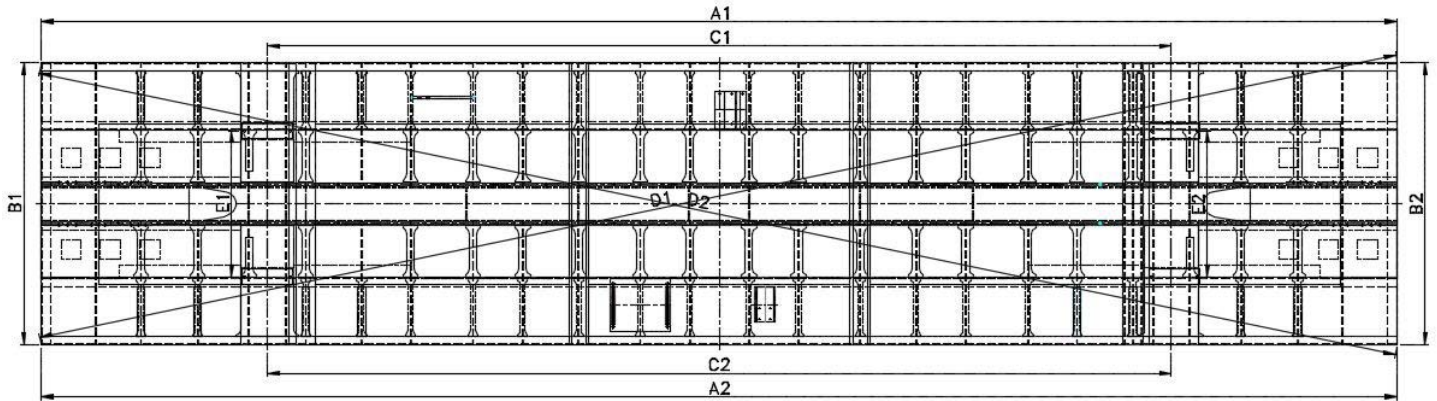


RDSO Drawing No :- WD-98057-S-06_It.No.-10_Alt-4				DATE :-	
Cross bar Short (Outer) No :-					
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks
1	Fitment of all components				
1.1	Welding				
1.2	Dressing				
2	Dimensions	As follows			
	Location	Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
			Works Inspection	RDSO Inspection	
i	Length Over Cross Member	A	671.5, +0,-2		
ii	Height at End	B	339, +0,-2		
iii	Distance of Top Flange at Top from Longitudinal PI (End)	C	80, +2,-0		

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

UNDERFRAME

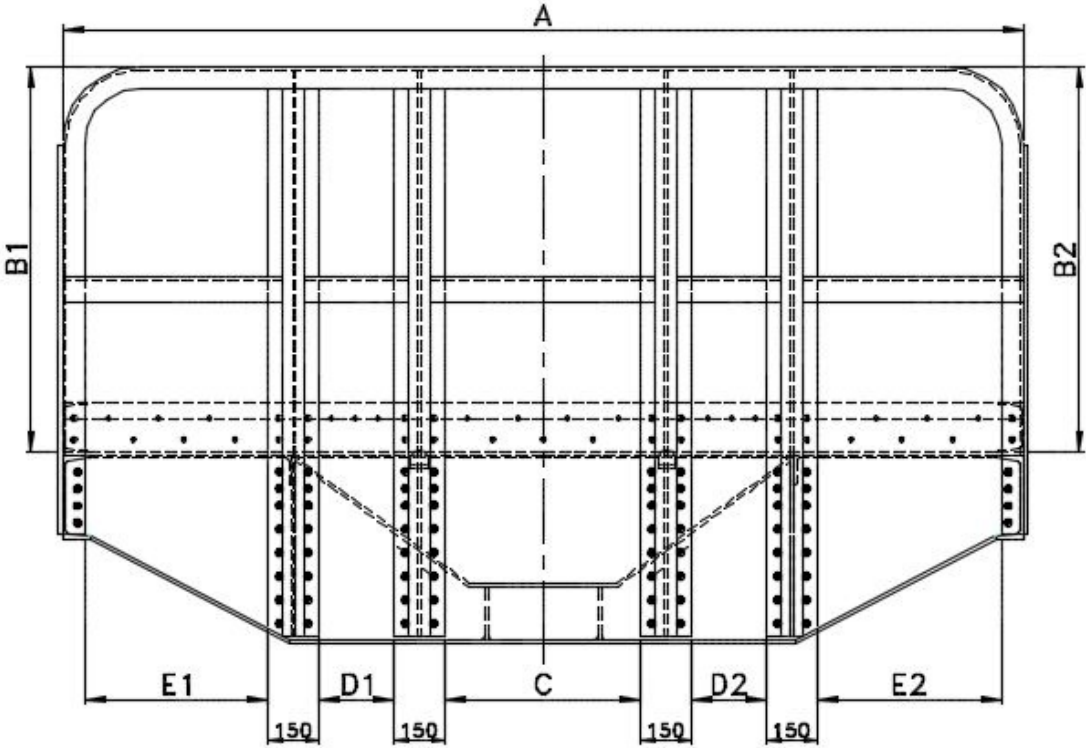


RDSO Drawing No :- WD-98057-S-04_Alt-5				DATE :-		
Underframe No :-						
Sl. No.	Stage	Works Inspection		RDSO Inspection		Remarks
1	Fitment of all components					
1.1	Welding					
1.2	Dressing					
2	Dimensions	As follows				
	Location	Nominal Dimensions & Allowable Deviation		Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i	Length over Head stock	A1 A2	13716, +7,-3			
ii	Width over Solebar	B1 B2	2845, ±3			
iii	Distance between Bolster / Bogie Centers	C1 C2	9144, +5,-2			
iv	Diagonal Difference over Head Stock	D1 D2	≤ 5			
v	Distance between Side Bearers	E1 E2	1474, ±2			
vi	Camber		9, ±2			

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

FIXED END

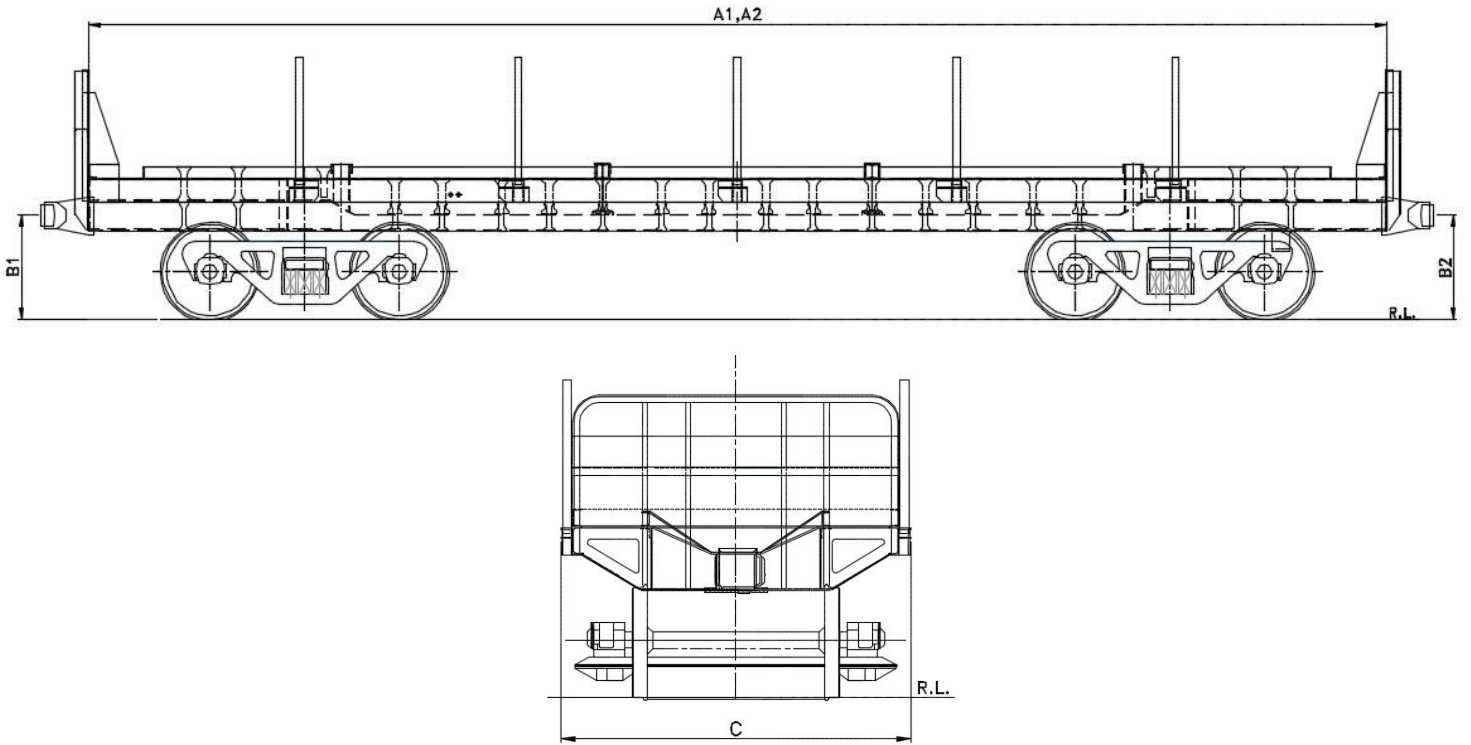


RDSO Drawing No :- WD-98057-S-16_Alt-2				DATE :-	
Fixed End No :-					
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks
1	Fitment of all components				
1.1	Welding				
1.2	Dressing				
2	Dimensions	As follows			
	Location	Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
			Works Inspection	RDSO Inspection	
i	Width over corner bend angle	A	2845 ±3		
ii	End Wall overall Height	B1	1145 ±3		
		B2			
iii	Distance between Inner to Inner Stanchion	C	580 ±2		
iv	Distance between inner to Outer Stanchion	D1	222.5 ±2		
		D2			
v	Distance between corner Angle to Outer Stanchion	E1	545 ±2		
		E2			

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

FINAL ASSEMBLY



Wagon No:-		U/F No :-		DATE :-	
Sl. No.	Stage	Works Inspection	RDSO Inspection		Remarks
1	Fitment of all components				
2	Riveting / Lock Bolting				
3	Welding				
4	Operation of Couplers				
5	Operation of Fabricated Stanchion				
6	Under Gear Examination				
7	Brake Test (i) Air Brake (ii) Hand Brake				
8	Painting				
9	Lettering				
10	Dimensions	As follows			
	Location	Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
			Works Inspection	RDSO Inspection	
i	Length over Head Stock	A1	13716, +7,-3		
		A2			
ii	Coupler height from R.L	B1	1105, +0,-5		
		B2			
iii	Width over Stanchion Bracket	C	3045 ±3		
iv	Side Bearer Clearance		Nil		

All dimensions are in mm.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

FINAL WAGON

1.	Wagon No.		2.	Date of offer	
3.	Underframe No.		4.	Name of the Wagon Manufacturer:	
5.	Contract/P.O. placed by		6.	Contract/P.O. no. and date and D.P. (Upto)	
7.	Running Gear				
a)	Bearing Make			Serial Nos.	
b)	Wheel Make			Serial Nos.	
c)	Axle Make			Serial Nos.	
d)	Bogie Make & Sr. nos.		e)	Coupler make & Sr. Nos.	
f)	Draft Gear make, Model & Sr. Nos.		g)	Air brake make	
h)	DV Make & Sr. No.		i)	Brake Cylinder make & Sr. Nos.	
j)	Aux. Reservoir Make		k)	Date of air brake testing	
l)	Date of SWTR Calibration		8.	Lock Bolt Make	
9.	Paint make		10.	Tare Weight	
11.	Shot Blasting		12.	D.M. Issue date	
13.	TXR fit memo issue date		14.	RFID Tag	

14. RAD availed _____

15. Defect Observed _____

16. Remarks _____

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

PROFORMA FOR SINGLE WAGON AIR BRAKE TEST AND OTHER ATTRIBUTES

Wagon No.:		U/F No.:	Date:	
SL. NO.	ATTRIBUTES	ACCEPTANCE LIMIT	WORKS INSPN.	RDSO INSPN.
1.	Check for paint-Thickness & Finish	DFT 40 microns after primer and 80 microns after finish paint. Paint surface to be free from blistering & peeling		
2.	Lettering & marking for size. Location & punch mark.	As per Drawing No. WD-98057-S-17 Alt.6 (or latest)		
3.	Coupler			
3.1	Ht. from rail level Operating of knuckle with operating handle	1105 +0 -5 Full knuckle throw lock to lock		
3.2	Articulation of coupler body	Free movement		
4.	Hand Brake			
4.1	Apply hand brake (by one person only and strike all wheels with hammer)	There should not be ringing sound.		
4.2	Release the hand brake and apply crow bar on one end brake block to take up all slack	All brake block must be released Gap between the brake and wheel thread not be less than 23.6 min (5.9x4)		
5.	Empty Load Box			
5.1	Operate the mechanism from any end in empty and loaded positions	Empty tie rod and loaded tie rod must engage. In loaded position the empty tie rod pins must be loose. In empty position loaded tie rod pins must be loose.		
6.	Air Brake and Slack Adjuster			
6.1	Distance between the control rod head and adjuster barrel (A)	Must be 70 +2 -0		
6.2	Dimension (E) i.e. the distance between the end of protection tube and a fixed mark on the slack adjuster pull rod	575 ± 25 mm		
6.3	Apply Air Brake and then release the same. Apply crow bar as one end of brake block to take up all slack	Gap should not be less than 23.6 mm (5.9 x 4)		

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

SL. NO.	ATTRIBUTES	ACCEPTANCE LIMIT	WORKS INSPN.	RDSO INSPN.
6.4	Rotate the barrel slack adjuster in clockwise direction (looking from the control rod end) to decrease the slack. Apply and release the Air Brake twice	Gap between the brake block and wheel tread as measured should be 23.6 +1 -0		
6.5	Now rotate the barrel in anticlockwise direction. Apply and release the Air Brake once	- do -		
7.	Air Brake Equipment Full service application			
7.1	Pressure in B.P.	$5 \pm 0.1 \text{ kg/cm}^2$		
7.2	Pressure in F.P.	$6 \pm 0.1 \text{ kg/cm}^2$		
7.3	Pressure in A.R.	$6 \pm 0.1 \text{ kg/cm}^2$		
7.4	Leakage from the system	0.1 kg/cm ² in 1 minute		
7.5	B.C. filling time in empty condition (pressure rise from 0 to 3.6 kg/ cm ²)	Empty 18 to 30 sec.		
	B.C. filling time in loaded condition (pressure rise from 0 to 3.6 kg/ cm ²)	Loaded 18 to 30 sec.		
7.6	Maximum B.P. Pressure in Kg/ cm ²	Empty $3.8 \pm 0.1 \text{ Kg/ cm}^2$ Loaded $3.8 \pm 0.1 \text{ Kg/ cm}^2$		
7.7	Depression in B.P. Pressure Required for full service application	1.3 to 1.6 Kg/ cm ²		
8.	Release after full Service Application			
8.1	Draining time B.C. pressure to fall from 3.8 ± 0.1 to 0.4 kg/ cm ²	Empty 45 to 60 sec.		
	Draining time B.C. pressure to fall from 3.8 ± 0.1 to 0.4 kg/ cm ²	Loaded 45 to 60 sec.		
9.	Piston stroke in mm	(a) Empty 85 ± 10 (b) Loaded 120 ± 10		
10.	Emergency application			
10.1	Emergency application BC filling time Empty- Pressure Rise from 0 – 3.6 kg/ cm ²	(a) Empty 18 to 30 sec.		
	Loaded- Pressure Rise from 0 – 3.6 kg/ cm ²	(b) Loaded 18 to 30 sec.		

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	

SL. NO.	ATTRIBUTES	ACCEPTANCE LIMIT	WORKS INSPN.	RDSO INSPN.
10.2	Maximum B.C. Pressure In kg/ cm ²	(a) Empty 3.8 ± 0.1 kg/ cm ² (b) Loaded 3.8 ± 0.1 kg/ cm ²		
10.3	Leakage from B.C.	0.1 kg/cm ² in 5 minutes		
11.	Sensitivity of brakes			
11.1	Isolate brake pipe from main line. Check the response of brakes when brake pipe pressure is reduced at the most equal to 0.6 kg/ cm ² in 6 seconds.	Brake should apply within 6 seconds.		
12.	Insensitivity of brakes			
12.1	Isolate brake pipe from mainline. Check the pressure of brakes when brake pipe pressure is reduced at least equal to 0.3 kg/ cm ² in 60 seconds.	Brake should not apply		
13.	Quick Release & Isolation			
13.1	After emergency brake application operate quick release valve	Brake cylinder and control reservoir should exhaust automatically.		
13.2	Bring isolating valve of distributor to off position	Auxiliary reservoir should also exhaust.		
14.	AR charging time Pressure rise from 0 to 5.0 kg/ cm ²	175±30 Sec. for C3W DV 60 to 120 Sec. for KEO DV		
15.	CR charging time Pressure rise from 0 to 4.8 kg/ cm ²	165±20 Sec. for C3W DV 160 to 210 Sec. for KEO DV		
16.	Check any twenty number of APD fittings (refer RDSO Drawing No. 4020/24)	Both legs of cotter are split at 90 deg. (approx.). Split Pin legs are opened at 180 deg. (approx.). Tack welding of cotter/split pin with washer/nut with bolts is adequate.		

Note: Sl. no. 14 & 15 to be checked at the time of prototype wagon only.

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name		Name	
Designation		Designation	
Date		Date	